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thylene sulphonic acid and its derivatives. 'A Serviceable Generator for Hydrogen Sulphide:.' By W. P. Bradley. This generator is so arranged that all the acid is used, and it only needs filling several times a year. The iron salt formed does not mix with the acid, but is drawn off and thrown away.

J. ELLIOTT GILPIN.

SOCIETIES AND ACADEMIES.

THE NATIONAL ACADEMY OF SCIENCES.

THE annual stated meeting of the National Academy of Sciences was held at Columbian University beginning Tuesday, April 18th, and ending Thursday, April 20th. The members missed the rooms to which they were so long accustomed in the National Museum, but the growth of this institution has been so marked that there is no longer any room available for such purposes. A committee has been appointed to secure, if possible, permanent quarters, and it is hoped that, in view of the relations of the Academy to the United States government, rooms may be set aside in some public building for the use of the Academy.

The papers presented at the public sessions were as follows :

1. *Ophiura Brevispina*, W. K. Brooks and Caswell Grave.
2. The Shadow of a Plant, A. Hall.
3. On the Tanner Deep Sea Tow Net, A. Agassiz.
4. On the Acalephs of the East Coast of the United States, A. Agassiz and A. G. Mayer.
5. On the Limestones of Fiji, E. C. Andrews ; communicated by A. Agassiz.
6. On the Bololo of Fiji and Samoa, W. McM. Woodworth ; communicated by A. Agassiz.
7. On the Diamond and Gold Mines of South Africa, A. Agassiz.
8. Progress in Surveying and Protection of the U. S. Forest Reserves, Chas. D. Walcott.
9. The Resulting Differences between the Astronomic and Geodetic Latitudes and Longitudes in the Triangulation along the Thirty-ninth Parallel, H. S. Pritchett ; introduced by Chas. D. Walcott.
10. The Work of the Division of Forestry, Department of Agriculture, Gifford Pinchot ; introduced by Chas. D. Walcott.
11. On the Development by Selection of Supernumerary Mammaræ in Sheep, A. Graham Bell.
12. On Kites with Radial Wings, A. Graham Bell.

13. Remarks on the Work of the Nautical Almanac During the Years 1877-98 in the Field of Theoretical Astronomy, S. Newcomb.

14. Exhibition of Specimens of *Nautilus pompilius*, W. K. Brooks and L. E. Griffin.

The new members elected are : Professor C. E. Beecher, Yale University ; Professor George C. Comstock, University of Wisconsin ; Professor Theodore W. Richards, Harvard University ; Professor Edgar F. Smith, University of Pennsylvania, and Professor E. B. Wilson, Columbia University.

The Academy adjourned to meet in New York next November.

THE PHILOSOPHICAL SOCIETY OF WASHINGTON.

THE 499th meeting of the Society was held at 8 p. m., April 1st, in the assembly room of the Cosmos Club. The first paper was by Mr. G. W. Littlehales on 'The Prospective Place of the Solar Azimuth Tables in the Problem of Accelerating Ocean Transit.' A brief abstract of this paper will appear later in SCIENCE. The second paper was by Mr. E. G. Fisher on 'Data Relating to Nickel Iron Alloy.' The third paper was by Mr. H. A. Hazen on 'Electric and Magnetic Weather.' Mr. Hazen said in part :

One of the earliest coincidences between the weather and magnetism was published in a set of curves in the Annual Report of the C. S. O. for 1882, showing the exact correspondence between the curves of diurnal range of magnetic declination and pressure of the air. In April, 1898, a period of 25.912 days was found from temperatures for 20 years at Omaha, Neb., and this period applied to the annual observations in the United States from 1870 to 1898 (about 400 occurrences) showed a marked maximum point on one day throughout. The largest number of auroras observed in any one day in the United States fell upon this same day (not included, however, in the count). In February, 1899, Dr. Ekholm sent a paper in which he had established a period of 25.92876 days from observations of the auroras in Sweden for 175 years. This period, applied to the above observations, gave almost a straight line. The great danger of using the twenty-four-hour change in any element was pointed out. It was shown

that there was almost an exact accordance between the diurnal range in magnetic declination, horizontal and vertical form. When the fluctuations in these elements from day to day were compared, however, there were remarkable periods of coincidence, combined with non-coincidence. It was shown that the curves for grains in a cubic foot of air and for pressure fluctuations were exactly coincident at St. Louis, Mo. When these curves were compared with the magnetic curves there was no difficulty found in matching them with one or another of the latter. This seemed to show an intimate connection between the phenomena, and it now remains for those versed in terrestrial magnetism to explain the want of coincidence in the phenomena.

E. D. PRESTON,
Secretary.

GEOLOGICAL SOCIETY OF WASHINGTON.

At the regular meeting of this Society, held in Washington, D. C., on April 12, 1899, Mr. Alfred H. Brooks communicated some 'Notes on the Geology of the Tanana and White River Basins, Alaska.'

The region embraces the Lower White and the major part of the Tanana River, both tributary to the Yukon. To the south the area is bounded by a part of the St. Elias range, by the Natzutin Mountains and by the Alaskan range, and lies chiefly in the region of the dissected Yukon plateau.

A complex of gneisses, gneissoid and massive granites, with some dioritic rocks, are believed to be the basal series. They are succeeded by metamorphic rocks which have been differentiated into three groups. These are unconformably overlaid by the Wellesley formation, consisting chiefly of conglomerate, of Devonian or Carboniferous age. On the Lower Tanana some sandstone and slate beds were noted and called the Nilkoka beds, and these are probably also Paleozoic. These have all suffered considerable deformation and often carry mineralized quartz veins. In the older and more altered rocks the quartz is more plentiful than in the younger beds. Assays of a number of samples gave traces of both gold and silver. A small area of very slightly deformed soft yellow sandstone was tentatively classed as Eocene.

The position of two systems of structure lines goes to show that the deformation of the region was caused by two synchronous thrusts coming from different directions, and these were probably lines of movement during several periods of deformation.

The summits of the old plateau remnants are a striking feature of the region and mark an old peneplain. During the late Tertiary time this peneplain was elevated and probably somewhat deformed and was then deeply dissected. The evidence goes to show that the drainage of the upper Tanana and middle White then flowed southeast and probably found its way to Lynn Canal by way of the valleys of the Nissiling, upper Alsek and Chilkat Rivers. A depression succeeded the uplift, and the partially drowned valleys were then filled with sediments. Toward the close of this period of depression the White River Valley was occupied by ice, and probably a little later glaciers moved down some of the southern tributaries of the Tanana. No evidence of general glaciation was found in the region. The last orographic disturbance was the elevation of the land mass to about its present position, and this caused a partial dissection and terracing of the sediment of the older valleys.

Mr. J. S. Diller exhibited specimens of *Paleotrochis* which had been described in 1856 by E. Emmons as siliceous corals and regarded as the oldest fossils known. Professor James Hall regarded them as concretions. Professor J. A. Holmes, of North Carolina, examined the rock in the field and considered it of igneous origin, while Mr. C. H. White, who examined the specimens collected by Holmes, pronounced the forms organic. Nitze and Hanna, of the Geological Survey of North Carolina, maintain the igneous characters of the rock, and this view is strongly supported by Mr. Diller, who showed that the supposed fossils and concretions are spherulites in a more or less altered rhyolite. Mr. Diller's paper will be published in full in the *American Journal of Science*.

W. F. MORSELL.

U. S. GEOLOGICAL SURVEY.

CHEMICAL SOCIETY OF WASHINGTON.

The regular meeting was held on March 9, 1899.

The first paper of the evening was read by Dr. F. K. Cameron and was entitled 'Acetone-Chloroform, 2d paper,' by F. K. Cameron and L. J. Briggs.

The second paper was read by Mr. T. H. Means and was entitled 'Estimation of the Salt Contents of Soil Waters,' by T. H. Means and F. K. Cameron. This method has been devised for a rapid estimation of the relative proportions of chloride, sulfates and carbonates in the 'alkali' soils of the Western districts. It is used as a check upon the electrical method for the determination of the soluble salt content of soils, as well as to furnish approximate analyses in the field without waiting for complete analyses to be made in the laboratory. The method determines chlorides, sulfates and carbonates in terms of the sodium salt. A sample of water is taken, or an extract is made of the soil, and the solution filtered or decanted. The solution need not be clear. An excess of barium nitrate (10 cc.) is added to 10 cc. of the soil extract, thus precipitating sulfates and carbonates. The excess of barium nitrate is titrated back with potassium chromate, using silver nitrate on a porcelain plate as an indicator. In the same vessel silver nitrate is added, using potassium chromate on the plate as an indicator, thus precipitating the chloride. A few drops of nitric acid are now added and the liquid heated, driving off the carbon dioxide from the barium carbonate. The excess of nitric acid is neutralized by powdered magnesium carbonate. Again the solution is titrated with potassium chromate, the quantity required giving the amount of carbonates. This subtracted from the sum of the sulfates and carbonates, as found above, gives the sulfates. This method makes the three titrations in one vessel, the apparatus being of such a simple nature that all can be carried in a camping outfit.

The third paper was read by Mr. J. K. Haywood and was entitled 'The Determination of Calcium and Magnesium in Ashes.' The author has found that in determining calcium and magnesium it is not essential to wash the voluminous ppt. of basic acetate of iron and phosphate of iron, but that results of almost equal accuracy are obtained by making the precipita-

tion in a 500-cc. flask, filling up to the mark, passing through a dry filter and using aliquot portions of the filtrate for analysis. The above is substantiated by experimental data.

The last paper was read by Dr. H. C. Bolton and was entitled 'The Classification of Chemistry Proposed by the International Catalogue Committee of the Royal Society, a Critical Analysis,' by W. P. Cutter and H. C. Bolton. The paper analyzed the proposed scheme of classification of chemical titles drawn up by the Committee on the International Catalogue of the Royal Society. It characterized the system as conglomerate, since numbers, Roman capitals, lower case, italic letters and Greek letters are mixed up with alphabetical headings. The system embraces also methods of notation which are very objectionable, inasmuch as the symbols are analogous in structure and appearance to chemical formulæ, yet they are essentially different. The scheme proposed, if intended to facilitate research, is pronounced by the authors of the analysis an almost total failure.

WM. H. KRUG,
Secretary.

THE MINNESOTA ACADEMY OF NATURAL SCIENCES.

At the regular monthly meeting of April 4th three papers of general interest were presented. Dr. F. W. Sardeson discussed the primitive structure of the Crinoid stem. Specimens were exhibited showing the manner of development from the first Cystidean type of structure, *i. e.*, an elongation of the body wall supported by hexagonal plates; the arrangement into five vertical rows of the alternating transversely elongated six sided plates; the arrangement of these plates in transverse circles forming distinct sections and joints, this being the most primitive structure of the stem seen in the Crinoidea; the circle of five plates in each section united in such manner as to form a solid ring with a central pentagonal perforation or canal.

Dr. U. S. Grant described a driftless area in northeastern Minnesota. The area in question is a small one, 8 by 12 miles, around Wilder Lake, entirely free from the drift which covers the country around it so deeply. The rock

surface is decayed as if no removal or grinding of the surface material had taken place by glacial action, and is entirely free from drift boulders. As a probable explanation the author suggested that this area lay to leeward of a great ice ridge which effectually shielded it from the direct action of the glacial ice stream.

Mr. H. B. Humphrey detailed his observations upon the influence of low temperatures upon plants, and described the difference of effect of sudden changes and gradual lowering of the temperature. Living specimens kept for a month or more in commercial cold-storage rooms at a point slightly below freezing exhibited phenomena of starvation.

CHARLES P. BERKEY,
Corresponding Secretary.

MINNEAPOLIS, MINN.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of the Academy of Science of St. Louis of April 3d a paper by Mr. Stuart Weller, entitled 'Kinderhook Faunal Studies, I: The Fauna of the Vermicular Sandstone at Northview, Webster county, Mo.,' was presented for publication; and Mr. Trelease exhibited a plaster cast of a gigantic monstrosity of *Cereus marginatus*, known as the Rosa de Organo, presented to the Missouri Botanical Garden by Professor Frederick Starr, and reported that this formation was locally abundant at points south from Aguas Calientes. The speaker exhibited a large number of comparable cactus monstrosities from the plant-houses of the Missouri Botanical Garden and the collection of the President of the Cactus Association of St. Louis, and a similar deformity of one of the cactus-like Euphorbias of the African region, commenting on this teratological type. It was shown that for the purposes of gardeners, for whom these unusual forms appear to possess a considerable interest, they are commonly divided into two types, in one of which, commonly designated by the varietal name *cristata* or *cristatus*, the monstrosity takes the form of a fan or a contorted ridge, while in the other, commonly designated by the varietal name *monstrosa* or *monstrosus*, it consists of irregular bunching of the branches and an interrup-

tion of the customary longitudinal ridges of such a genus as *Cereus*.

WILLIAM TRELEASE,
Recording Secretary.

BOSTON SOCIETY OF NATURAL HISTORY.

A GENERAL meeting was held March 15th; twenty-eight persons present.

Mr. E. C. Jeffrey, in an account of the genus *Equisetum*, stated briefly the sexual and asexual methods of development. The internal structure of the stem was described, and the relationships of the Equisetæ to the Lycopods and ferns were noted. Structurally Archæocalamites resembles the higher Lycopods. The branches of Calamites originate from the center of the ring of nodal wood or from its lower border. Casts of Calamites show pith.

Dr. C. R. Eastman read a paper on some new North American fossil fishes. An abstract will appear in an early number of SCIENCE.

SAMUEL HENSHAW,
Secretary.

DISCUSSION AND CORRESPONDENCE.

ON THE ACTION OF THE COHERER.

EXPERIMENTS have been made at the physical laboratory of the Missouri State University which show that the action of the Branly tube is due to an actual cohering of the particles. The action consists, first, in an electrostatic attraction causing the particles to come in contact, and, second, in a fusion of the points of contact.

An instrument has been designed and constructed which clearly shows this coherence and renders its study possible. It consists of two electrodes, one a metallic plate on which the filings are placed, and the other a metallic point carried on a pivoted arm swinging in a vertical plane. If a considerable difference of potential is maintained between these electrodes, and the point be brought in contact with the filings and then carefully lifted, a thread will attach itself to the point and may be drawn out to two or more inches in length. The difference of potential has, in our experiments, been produced in a variety of ways. Thus the instrument was placed in circuit with two dry cells and a 160-ohm relay, and threads